



High efficiency floor standing fully condensing boiler with ultra low NOx emission for single and modular/cascade applications

Outputs: Gas 110 Eco
 - 65 13.3 - 65 kW
 - 115 18.4 - 113.8 kW



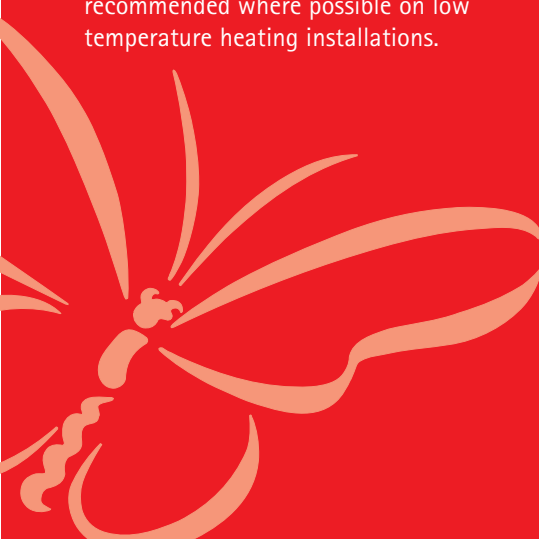
Gas 110 Eco

Modular / Cascade
 Gas Fired Condensing Boiler



Introduction

Remeha Gas 110 Eco boilers are floor standing gas-fired condensing boilers fitted with an "Open Therm" control interface which enable direct weather compensation using Remeha single and multi boilers controls or the customer can choose to use external control options supplied by others without affecting boiler performance. The Remeha Gas 110 Eco has been developed specifically to fit directly into the same floor area as a traditional boiler of equal output. This will promote the benefit of higher energy efficiency and lower carbon emissions. They are designed for sealed and open vented heating systems, with a maximum operating temperature of 90°C. Installation is recommended where possible on low temperature heating installations.



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Boiler description

The Remeha Gas 110 Eco 115 / 65 are floor standing, condensing boilers. The one piece, cast aluminium heat exchanger and other major components are contained within a sealed air box. This forms the main boiler casing with a removable front section for maintenance purposes. All electrical and electronic controls are contained within the boiler casing.

The combined flue gas outlet and combustion air inlet are mounted on the top of the boiler, with the flow, return, gas and condensate connections located at the rear of the boiler. The boiler is suitable for room-sealed or open flue applications. It has been designed for central heating and indirect hot water production. It must be installed on a fully pumped system and is suitable for use on both sealed and open vented installations (minimum operating pressure of 0.5 bar open vented and 0.8 bar pressurised).

The pre-mix, down-firing gas burner (NG or LPG) with its gas/air ratio control system, ensures clean, trouble free operation with higher than average efficiencies (of up to 110% NCV) in the condensing mode, combined with ultra low NOx and minimum CO emissions. The standard control package allows actual and set values to be read and adjusted on the built-in digital display which also provides normal operating and fault code indication. An intelligent, advanced boiler control (abc) continuously monitors the boiler conditions, varying the heat output to suit the system load. The control is able to react to external "negative" influences in the rest of the system (flow rates and air/gas supply problems) maintaining boiler output for as long as possible without resorting to a lock out condition. At worst the boiler will reduce its output and/or shut down (shut-off mode); awaiting the "negative" conditions to return to normal before re-starting. The 'abc' control cannot override the standard flame safety controls.

Declaration of compliance

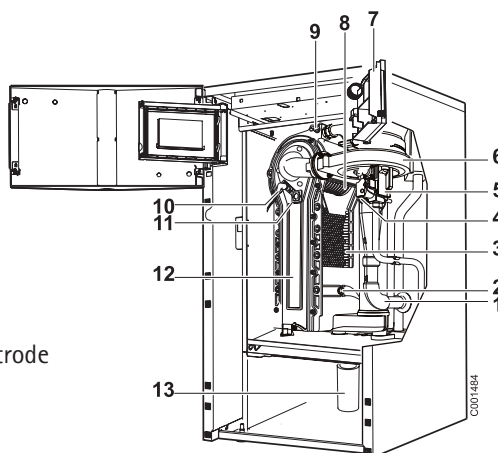
We hereby certify that the series of appliances specified hereinafter is in compliance with the standard model described in the EC declaration of compliance, and that it is manufactured and marketed in compliance with the requirements and standards of the following European Directives.

Manufacturer:	Broag-Remeha Ltd, Remeha House, Molly Millars Lane RG41 2QP WOKINGHAM, Berks
Product type:	Gas fired condensing boiler
Formats:	Remeha Gas 110 Eco 115 / 65
Standards Et rules:	- 90/396/EEC Gas Appliance Directive Reference Standards: EN 437; EN 483; EN 625; EN 677 - 2006/95/EC Low Voltage Directive Reference Standard: EN 60.335.1 - 2004/108/EC Electromagnetic Compatibility Directive Generic standards: EN1000-6-3 ; EN 61000-6-1 - 92/42/EEC Efficiency Directive ****
Inspecting organisation:	Gastec
Values:	NOx (mg/kWh) dry @ 0% O2 Gas 110 Eco 65 25 21 - DIN 4702 Teil 8 Gas 110 Eco 115 30 31 - EN 297A3 CE-0063BS3826

Typical boiler construction

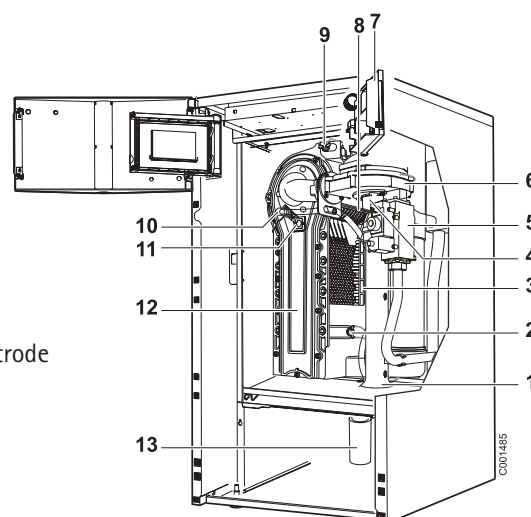
Gas 110 Eco 65

1. Fan air inlet
2. Return sensor
3. Heat exchanger
4. Venturi
5. Gas valve
6. Fan
7. Control panel
8. Burner
9. Flow temperature sensor
10. Ignition electrode + Ionisation electrode
11. Flame inspection window
12. Heat exchanger inspection cover
13. Siphon



Gas 110 Eco 115

1. Fan air inlet
2. Return sensor
3. Heat exchanger
4. Venturi
5. Gas valve
6. Fan
7. Control panel
8. Burner
9. Flow temperature sensor
10. Ignition electrode + Ionisation electrode
11. Flame inspection window
12. Heat exchanger inspection cover
13. Siphon



Efficiency information

SBEM efficiency

65–97.57% 115–96.45% – The SBEM 'heat generator seasonal efficiency' figures are based upon GCV using formula $(30\% * 0.81) + (100\% * 0.19)$

Annual efficiency

Up to 109% at Hi (98% at Hs) at an input of 30% and a return temperature of 30°C.

Heat to water efficiency

- a. Up to 99% at Hi (89% at Hs) at an average water temperature of 70°C (80/60°C) – Gas 110 Eco 65 only.
- b. Up to 98% at Hi at an average water temperature of 70°C (80/60°C) – Gas 110 Eco 115 only, also 88% at Hs.
- c. Up to 110% at Hi (99% at Hs) at an average water temperature of 35°C (40/30°C) – Gas 110 Eco 65 only.
- d. Up to 106% at Hi at an average water temperature of 35°C (40/30°C) – Gas 110 Eco 115 only, also 95% at Hs.

Note: NCV = Hi, GCV = Hs

Application information

The Remeha Gas 110 Eco can be used on all new and refurbishment projects in both single and multiple (modular/cascade) configurations. Conventional and room-sealed flue system capability means that the boiler can be sited almost anywhere within a building. The Remeha weather compensators options are able to communicate directly with the boiler controls (two wire) to make full use of its fully modulating feature, ensuring that the boiler closely matches the system demand at all times. External control systems (BMS) can be interfaced with the boiler to provide on/off, high/low or modulating (0–10v) control options.

Advantages at a glance

- High efficiency: 110% NCV at 40/30°C (99% GCV)
- Boiler control:
 - a) Modulating (18-100%)
 - b) High/low (18-100%)
 - c) On/off
- Conventional or "room sealed" flue options
- The boiler is particularly suitable for retro-fit applications, having a small footprint
- Premix burner for clean combustion
- Low NO_x <35mg/kWh (O₂=0%, dry)
- Quiet operation <48 dBA
- Cascade / Modular packages for up to 6 boilers
- Quick and easy installation
- Advanced boiler control, Remeha's 'abc', for reliable heat delivery
- Digital display
- Data file for storing information
- Remote signalling options
- Cast aluminium heat exchanger
- Easy maintenance
- Built-in calorifier control
- Options for modular control and/or weather compensator
- Control 0-10V signal or volt free
- PC connection
- For use with natural gas and L.P.G. (Some models require a conversion kit)

Operating principle

Combustion air is drawn into the closed air box, by a variable speed fan, through the air inlet connection from the plant room (open flued) or from outside via the concentric flue system (room-sealed). On the inlet side of the fan is a specially designed venturi which is connected to the outlet side of the gas valve.

Depending on the demand (under the dictates of flow/return sensor and other external/internal control inputs) the electronic control unit directly monitors the volume of gas and air being delivered to the premix burner. This mixture is initially ignited by the combined ignition/ionisation probe which then monitors the state of the flame. Should the flame not ignite or be unstable, within the pre-set safety time cycle, the controls will shut the boiler down (after 5 attempts) requiring manual intervention to reset the boiler. The digital display will also indicate a flashing fault code confirming the reason for the failure.

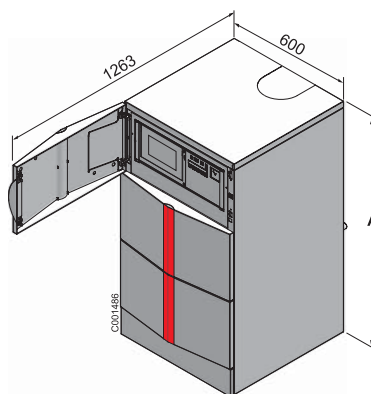
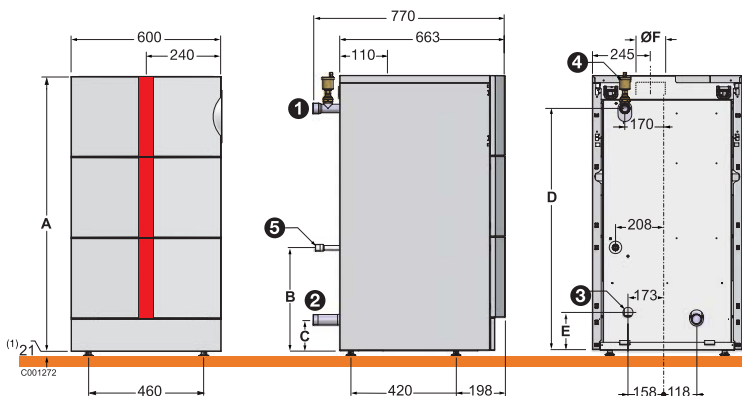
The products of combustion in the form of hot flue gases are forced through the heat exchanger, transferring their heat to the system water (the flue gas temperature is reduced to approximately 5°C above the temperature of the system return water) then discharged via the condensate collector, vertically through the flue connection to atmosphere. Because of the low flue gas exit temperature there will be a vapour cloud formed at the flue gas terminal – this is not smoke, simply water vapour formed during the combustion process. If the controls allow the flow and therefore return temperature to fall below dew point (55°C) this water vapour will begin to condense out in the boiler transferring its latent heat into the system water, increasing the output of the boiler without increasing gas consumption. Condensation formed within the boiler and flue system is discharged from the boiler to an external drain via the drain pan/siphon supplied.



Dimensions

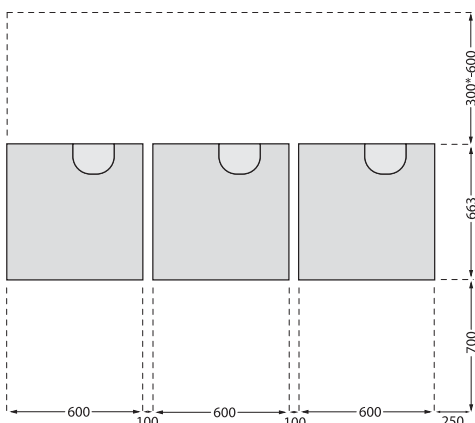
- | | |
|---|---|
| 1 | Heating outlet
R 1 1/4 |
| 2 | Heating return
R 1 1/4 |
| 3 | Condensates discharge
(Ø 25 mm external) |
| 4 | Automatic air vent |
| 5 | Gas inlet R 3/4 |

- | | |
|-----|---|
| A | Remeha Gas 110 Eco 65: 1100 mm
Remeha Gas 110 Eco 115: 1322 mm |
| B | Remeha Gas 110 Eco 65: 410 mm
Remeha Gas 110 Eco 115: 632 mm |
| C | Remeha Gas 110 Eco 65: 124 mm
Remeha Gas 110 Eco 115: 346 mm |
| D | Remeha Gas 110 Eco 65: 968 mm
Remeha Gas 110 Eco 115: 1190 mm |
| E | Remeha Gas 110 Eco 65: 152 mm
Remeha Gas 110 Eco 115: 374 mm |
| ØF | Forced flue connection
Remeha Gas 110 Eco 65: Ø 100/150 mm
Remeha Gas 110 Eco 115: Ø 100/150 mm |
| R | Thread |
| (1) | Basic dimension 21 mm
adjustment possible: 21 to 40 mm |

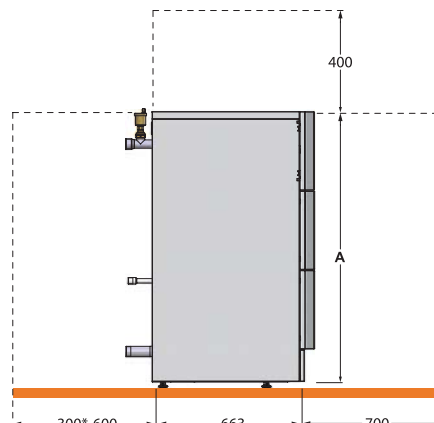


Maintenance and Service clearances

View from above



View from the side



Clear space should be left around the boiler :

- 700mm in front of the boiler
 - 400mm above the boiler
 - 100mm each side of the boiler
- (Facilitates removal of the casing)

Note: 300mm refers to singular boiler installations, 600mm refers to modular boiler applications.

Technical data

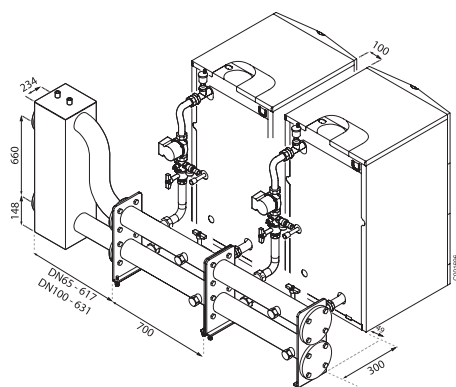
Boiler type		Remeha Gas 110 Eco 65	Remeha Gas 110 Eco 115
CE identification no	****	CE-0063BS3826	
General			
Input control		Modulating, 0 - 10V or on/off	
Nominal output (80/60 °C) pn	min. kW	12	16.6
	max. kW	61	107
Nominal output (50/30 °C) pn	min. kW	13.3	18.4
	max. kW	65	113.8
Nominal input	min. kW	12.2	17.2
	max. kW	62	111
Gas and flue gas side			
Category		II2h3p / I2h	
Inlet gas pressure natural gas	mbar	17/30	
Inlet gas pressure propane	mbar	37/50	
Gas consumption natural Gas	M3/h	6.6	11.7
Gas consumption propane	Kg/h	4.8	N/A
NOx emission (dry 0% O2) EN297 A3	mg/kWh	32	35
NOx classification		5	5
Residual fan pressure		100	250
Mass flue Gas flow rate	min	21	29
Mass flue Gas flow rate	max	104	178
CO2 content in flue gases natural gas		9	9
CO2 content in flue gases propane		10.7	N/A
Average flue gas temperature (75/60 °C)	°C	65	67.9
Type classification with respect to flue gas discharge		B23 C13 C33 C43 C53 C63 C83	
Central heating side			
High limit temperature (adjustable)	°C	110	110
Operating temperature range	°C	90	90
Minimum working pressure sealed system	bar	0.8	0.8
Minimum working pressure open vented	bar	0.5	0.5
Maximum working pressure	bar	4	4
Water content	litres	6.5	7.5
Hydraulic resistance at $\Delta t = 20$ °C	mbar(kpa)	175 (17.5)	230 (23)
Hydraulic resistance at $\Delta t = 11$ °C	mbar(kpa)	580 (58)	830 (83)
Nominal water flow rate $\Delta t = 20$ °C	M3/h(l/s)	2.62(0.73)	4.6(1.28)
Nominal water flow rate $\Delta t = 11$ °C	M3/h(l/s)	4.76(1.32)	8.36(2.32)
Condensation water pH		3 - 5	3 - 5
Electrical			
Main voltage	V/Ph/Hz	230/1/50	230/1/50
Input power (without pump)	min Watt	30	40
Input power (without pump)	max Watt	85	240
Input power (pump only)	max Watt	190	190
Insulation class	IP	21	21
Other			
Shipping weight		116	133
Environment temperature	°C	0-40	0-40
Colour of casing	RAL	White/2002 Red	White/2002 Red
Noise level at a distance of 1M from the boiler dB(A)		< 48	< 52.5

Modular/cascade boiler options

Smart Connection Technology

Broags new 'Smart Connection Technology' modular pipe work kit has been designed to reduce installation time and simplify the planning of the primary circuit layout, for up to 6 boilers.

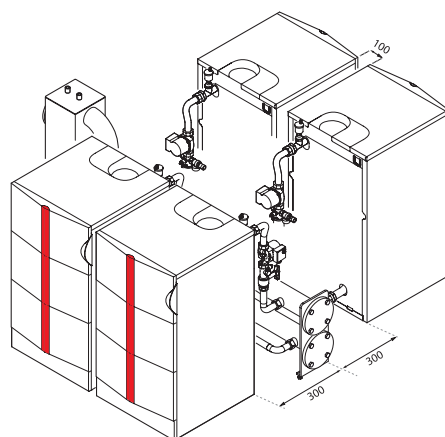
The pipe work kit comprises of a flow & return assembly to each boiler which incorporates a suitably sized circulation pump, safety relief valve set at 3 Bar and isolation valves.



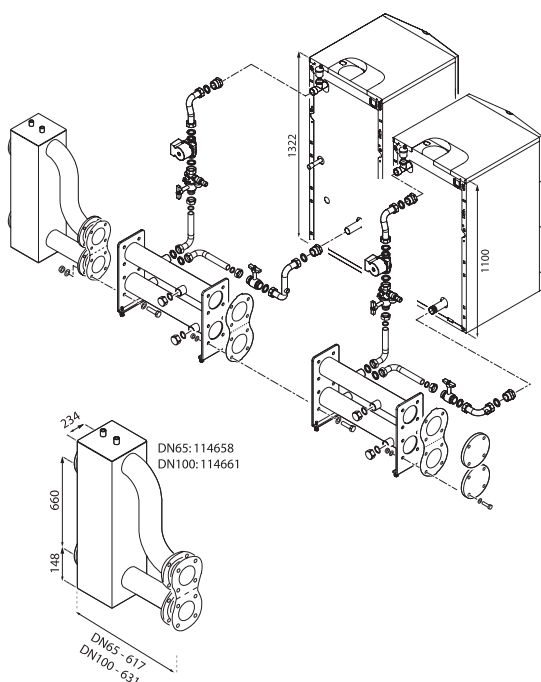
Each manifold (one per boiler) simply bolts together at 700mm centres, with a low loss header and connecting / blanking flanges completing the installation.

The standard manifold provides connections for both in-line and back to back boiler configurations, simply blank off the connections not used with the caps contained within the kit.

The pipe work kits have been designed to operate at a 15 °C ΔT with the primary pump set on speed 2 on the 65 model and speed 3 on the 115 model.



Smart Connection Technology kit assembly detail



Further options

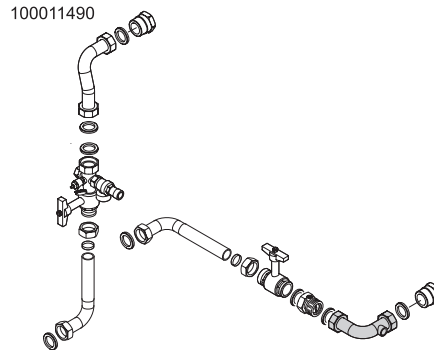
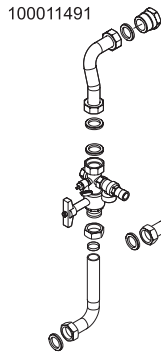
The following options can be specified at time of order:

- 0-10v control interface (Temperature or output)
- Flue gas damper
- Facility to fit outside sensor
- Rematic 2945 CK3 controller
- Rematic MC4 controller (4 boilers max)
- Celcia 20 controller single or multiple boilers (multiple boilers in conjunction with MC4)

Note 1: When connecting the interlocks or communication wires of more than one boiler in parallel observe and match the connection polarity.

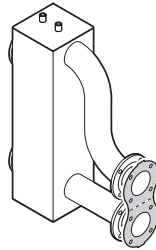
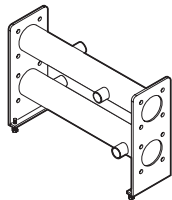
Note 2: Unless otherwise stated at the time of ordering, the boiler will be delivered with the standard control fitted. Additional options will be supplied for on-site fitting by others.

Smart Connection Technology kit component list



DN65 : 100011703
DN100 : 100011492

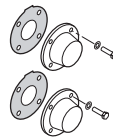
DN65 : 114658
DN100 : 114661



DN65 : 112632
DN100 : 112633

DN65 : 111701
DN100 : 111703

111708



S10004
(1)



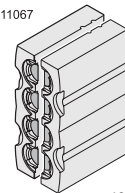
Smart Connection Technology kit - component list

In line kit option	Pipework kit	Qty	Pump	Qty	Header	Qty	Counter flanges	Qty	Blank flanges	Qty	Blanking caps	Qty	LL header	Qty
2 x 65	100011490	2	S10004	2	100011703	2	112632	1	111701	1	111708	2	114658	1
3 x 65	100011490	3	S10004	3	100011703	3	112632	1	111701	1	111708	3	114658	1
4 x 65	100011490	4	S10004	4	100011703	4	112632	1	111701	1	111708	4	114658	1
5 x 65	100011490	5	S10004	5	100011703	5	112632	1	111701	1	111708	5	114658	1
6 x 65	100011490	6	S10004	6	100011703	6	112632	1	111701	1	111708	6	114658	1
2 x 115	100011491	2	S10004	2	100011703	2	112632	1	111701	1	111708	2	114658	1
3 x 115	100011491	3	S10004	3	100011703	3	112632	1	111701	1	111708	3	114658	1
4 x 115	100011491	4	S10004	4	100011703	4	112632	1	111701	1	111708	4	114658	1
5 x 115	100011491	5	S10004	5	100011492	5	112633	1	111703	1	111708	5	114661	1
6 x 115	100011491	6	S10004	6	100011492	6	112633	1	111703	1	111708	6	114661	1

Smart Connection Technology kit - optional parts list

In line kit option	LLH insulation	Qty	Header bends	Qty	Flue damper	Qty
2 x 65	111067	1	111788	1	100002685	2
3 x 65	111067	1	111788	1	100002685	3
4 x 65	111067	1	111788	1	100002685	4
5 x 65	111067	1	111788	1	100002685	5
6 x 65	111067	1	111788	1	100002685	6
2 x 115	111067	1	111788	1	100002685	2
3 x 115	111067	1	111788	1	100002685	3
4 x 115	111067	1	111788	1	100002685	4
5 x 115	111067	1	111790	1	100002685	5
6 x 115	111067	1	111790	1	100002685	6

111067



DN65 : 111788
DN100 : 111790

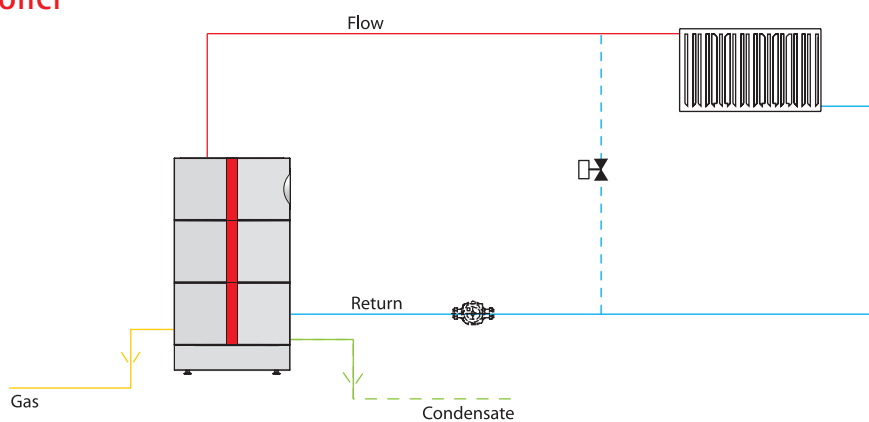


100002685

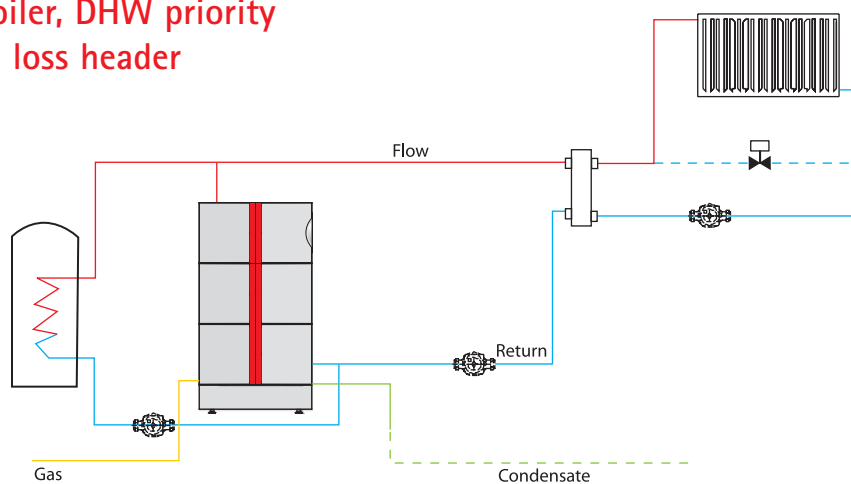


Typical installations

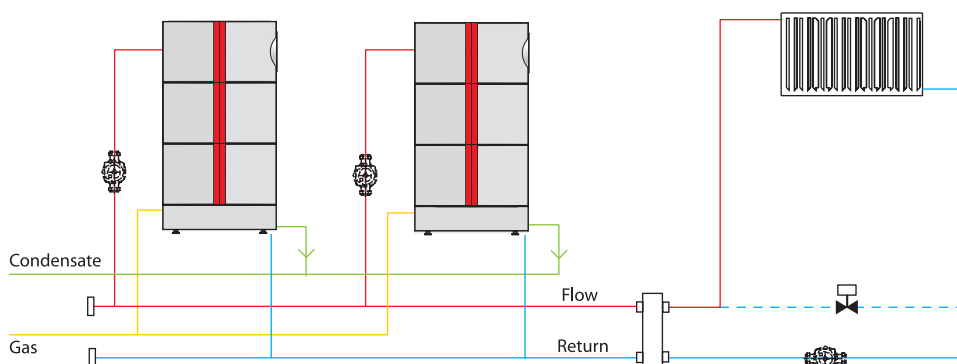
Single boiler



Single boiler, DHW priority with low loss header



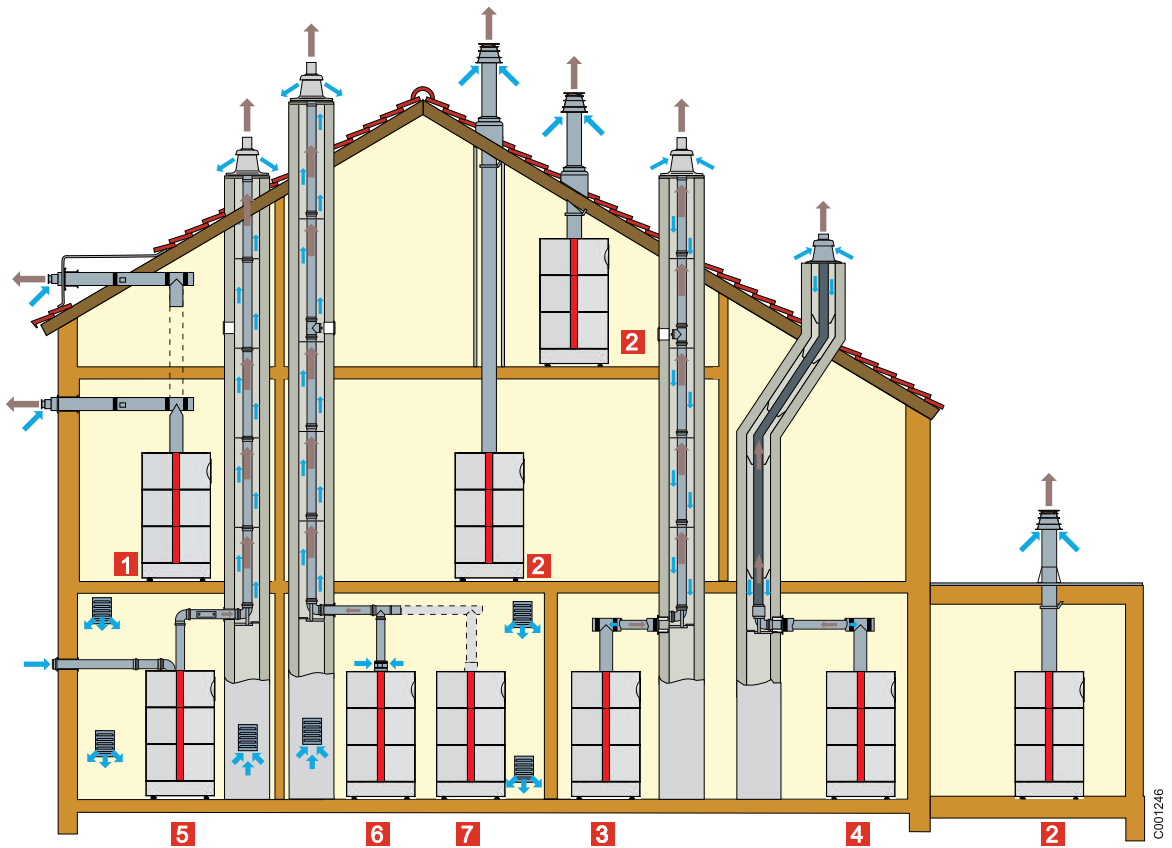
Modular/cascade boiler configuration



Note 1: These layouts do not constitute a design. Calculations must be carried out to ensure pipework and pumps are sized to match boiler nominal flows against system design flow requirements.

Note 2: All connections are to the back of the boiler

Typical flue options



1 Flue type C13 :

Air/flue gas connection by means of concentric pipes to a horizontal terminal (so-called forced flue)

2 Flue type C33 :

Air/flue gas connection by means of concentric pipes to a vertical terminal (roof outlet)

or

3 Flue type C33 :

Air/flue gas connection by concentric pipes in the boiler room and single pipes in the chimney (combustive air in counter current in the chimney)

or

4 Flue type C33 :

Air/flue gas connection by concentric pipes in the boiler room and single "flex" in the chimney (combustive air in counter current in the chimney)

5 Flue type C53 :

Air and flue gas connection separated by means of a bi-flow adapter and single pipes (combustive air taken from outside)

6 Flue type B23P :

Chimney connection (combustive air taken from the boiler room)

7 Flue type B23P :

Cascade installation Compulsory accessories:
Flue damper

Note: If further classification is required please refer to a specialist flue contractor

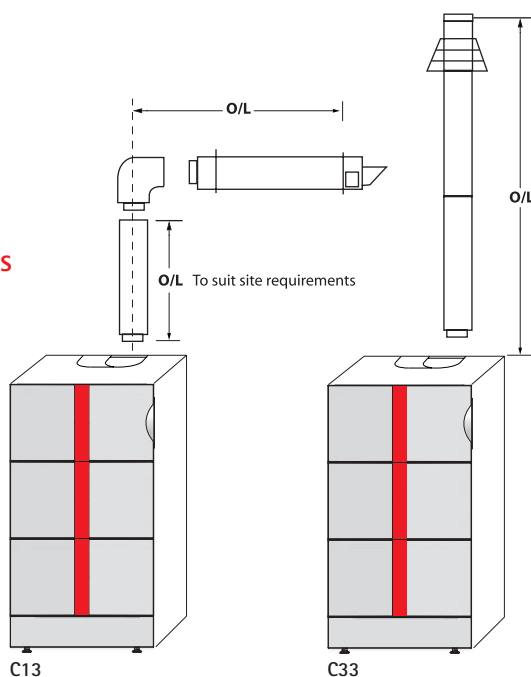
Typical flue systems Concentric room-sealed applications (C13/C33)

Calculation data – room sealed applications

	Flue option	Gas 110 65	Gas 110 115
Maximum Length O/L Using 100/150mm Concentric Flue	C13	9 M	5.9 M
	C33	11.5 M	9.4 M

90° Elbow = An equivalent length of 1.9 M
45° Elbow = An equivalent length of 1.2 M
Inspection Tee = An equivalent length of 3.3 M

Note: Flue Lengths can be extended by using larger diameter flue pipe. For further clarification please consult a flue specialist and Broag Technical Department.



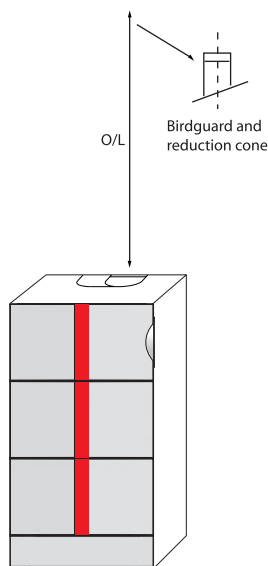
Conventional flue B23P Conventional flue

Calculation data conventional flue

	Flue option	Gas 110 65	Gas 110 115
Maximum Length O/L Using 100 Single Wall Flue	B23P	27 M	19 M

90° Elbow = An equivalent length of 4.9 M
45° Elbow = An equivalent length of 1.4 M
Inspection Tee = An equivalent length of 5.3 M

Note: Flue Lengths can be extended by using larger diameter flue pipe. For further clarification please consult a flue specialist and Broag Technical Department.



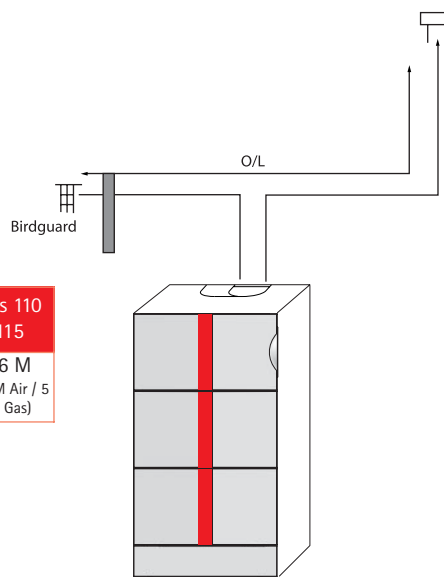
CLV system B53 (Twin pipe – two zone)

Calculation data –CLV system (twin pipe – two zone) applications

	Flue option	Gas 110 65	Gas 110 115
Maximum Length O/L Using 2 No 100mm Single Wall Flues	C53	23 M	16 M (11 M Air / 5 M Gas)

90° Elbow = An equivalent length of 5 M
45° Elbow = An equivalent length of 1.2 M
Inspection Tee = An equivalent length of 5.3M

Note: Flue Lengths can be extended by using larger diameter flue pipe. For further clarification please consult a flue specialist and Broag Technical Department.

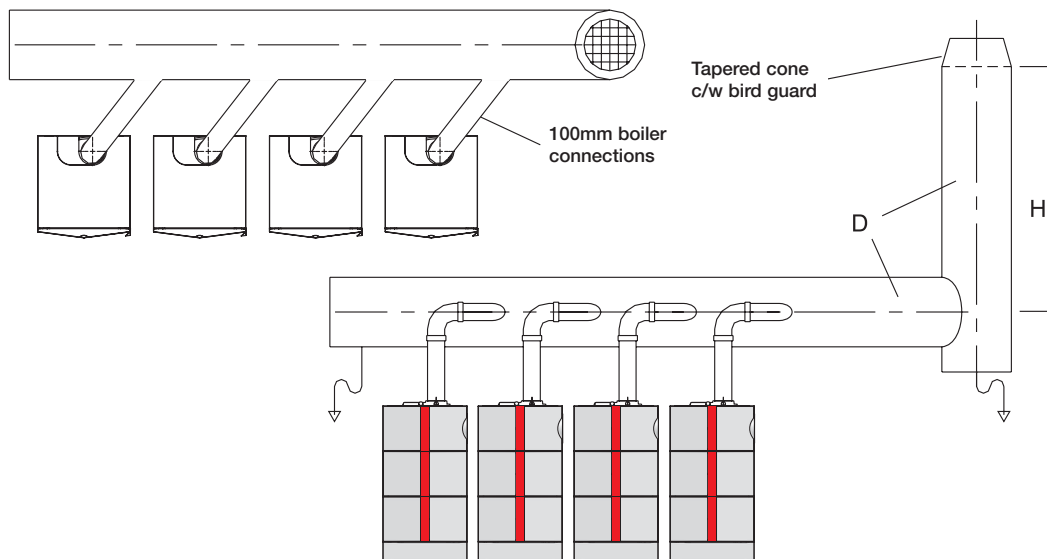


Modular flue systems

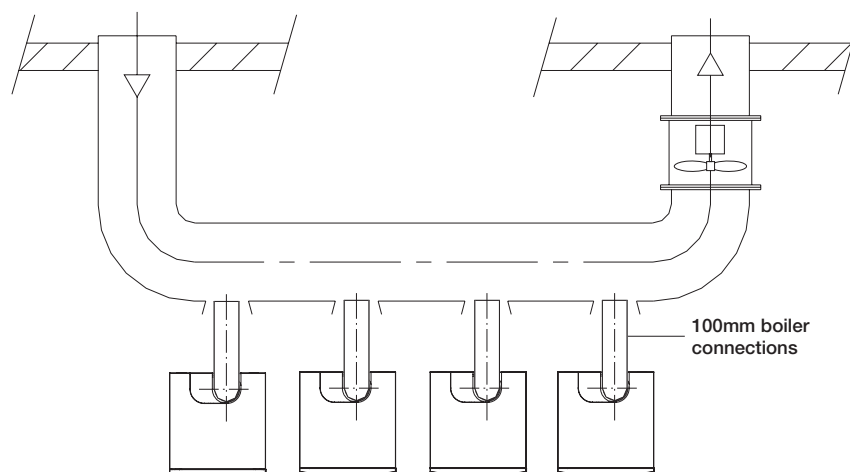
The flue damper kit allows for safe and efficient operation of multiple Gas 110 Eco boilers when used on a common flue system. The following table offers flue system sizing guidance, based upon the total heat output and the available chimney height. Please consult a flue specialist and Broag technical department for any further assistance.

Heat output P kW	Boiler types	Ød-ØD(mm)			
		H-2-5m	H-5-9m	H-9-13m	H-13-17m
122	2x65	155	145	145	145
183	3x65	220	200	195	190
244	4x65	265	240	230	225
305	5x65	305	275	255	250
366	6x65	340	300	280	275
214	2x115	200	185	180	180
321	3x115	285	255	240	235
428	4x115	345	305	285	275
535	5x115	395	345	323	315
642	6x115	440	385	355	345

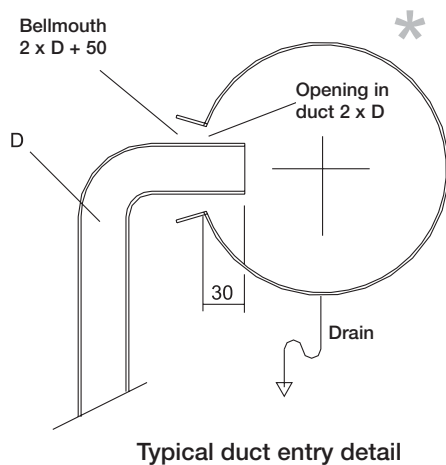
Note: Connect the boilers to the horizontal header using swept connections.



Flue dilution systems



Flue dilution systems continued



Note: Please contact a flue specialist for assistance with Flue dilution system design.

* Typical modular flue dilution system showing the flue break necessary for use on all pre-mix boilers, to the flue break prevents the dilution fan effecting the gas/air ratio control system within the boiler.

Electrical installation and controls

General

The Remeha Gas 110 Eco is supplied as standard with electronic control and flame ionisation safety controls, with a specially designed microprocessor at the heart of the control system.

Specifications

Electrical supply

The Remeha Gas 110 Eco must have a permanent 230V-50Hz single phase supply rated at 6.3 amps. The control unit is not phase/neutral sensitive.

Control box

Manufacture:	Gasmodul
Model:	MCBA 1461 D
Supply voltage:	230 V/50 Hz
Electrical rating:	10 VA
Pre-purge time:	0.3 seconds
Post-purge time:	10 seconds
Safety time:	3 seconds
Anti-hunting time:	150 seconds
Pump run on (HTG):	1 -15 minutes
Pump run on (DHW):	5 minutes

Fuse specification

The boiler is protected by fuses:
 On the 203v power supply located in the control panel 6.3amps (fast acting).
 On the control box located on the bottom right hand side of the boiler.
 - control circuit 230v 2 amps (fast acting).
 - control circuit 24v d.c. 4 amps (slow acting).

Boiler temperature control

The Remeha Gas 110 Eco has electronic temperature control with flow and return temperature sensors. The flow temperature can be adjusted between 20 and 90°C.

High limit temperature protection

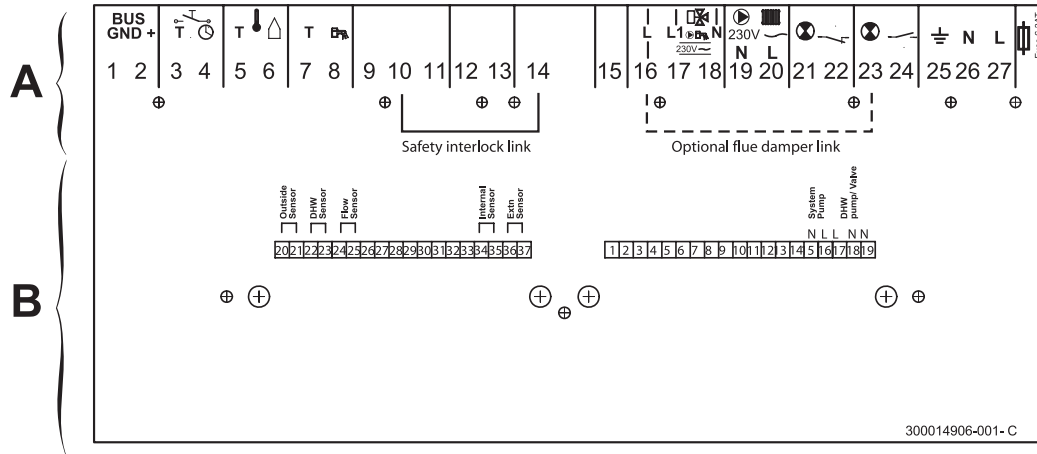
The high limit, temperature protection device switches off and locks out the boiler when the flow temperature exceeds the high limit set point (adjustable). When the fault is corrected the boiler can be restarted by using the reset key on the control panel.

Low water protection (flow and content)

The Remeha Gas 110 Eco are supplied with a low water protection on the basis of temperature measurement. By modulating back at the moment that the water flow threatens to fall too low, the boiler is kept operating for as long as possible. In the event of low flow ($F/R_{st} > 45^{\circ}\text{C}$) the boiler will shut off and not lockout. If the boiler is fired dry it will go to lockout (code 18).

Electrical connections and controls

The Gas 110 Eco 115 / 65 must have a fixed 230V - 50Hz single phase mains supply. It must be powered by a circuit containing a double pole switch with an opening distance 3 mm.



A. Standard terminal connections

- 1 _____
0 - 10 V or modulating controller when used with interface S55443 (VFC)
- 2 _____
- 3 _____
Enable On / Off or 1st stage firing
- 4 _____
- 5 _____
High / low (2nd stage) or outdoor sensor
- 6 _____
- 7 _____
DHW sensor or volt free thermostat
- 8 _____
- 9 _____
- 10 _____
Safety interlock link 10 - 14
- 11 _____
- 12 _____
N.A.
- 13 _____
- 14 _____
Safety interlock link 14 - 10
- 15 _____
- 16 _____
DHW diverting valve or DHW primary pump, 240 V signal to BMS (power supply live)
- 17 _____
- optional Flue damper kit connections use 18 for neutral and link 16 to 23.
- 18 _____
- 19 _____
Boiler pump or system pump (max. 1 Amp)
- 20 _____
- 21 _____
Common alarm volt free (opens on failure)
- 22 _____
- 23 _____
Boiler run volt free (closes on run) optional Flue damper kit connections use 24 for live and link 23 to 16.
- 24 _____
- 25 _____
- 26 _____
Power supply
- 27 _____
F3 6.3 A fuse

B. Optional terminal connections (supplied with the Rematic 2945 controller kit)

- 15 _____
System pump
- 16 _____
- 17 _____
DHW pump
- 18 _____
- 20 _____
Outdoor sensor
- 21 _____
- 22 _____
DHW sensor
- 23 _____
- 24 _____
Flow temperature sensor
- 25 _____
- 34 _____
Internal sensor
- 35 _____
- 36 _____
- 37 _____
Extension timer

Note: The power and control terminal wiring strip can be accessed by removing the top casing panel and instrument cover plate. All external connections are made on the 27 way terminal strip (A). There is a facility for a second terminal strip (B), this is supplied with the Rematic 2945 controller kit and provides all necessary wiring connections to interface with the boiler.

Optional controls and accessories

a) Rematic 2945 3C K - Part KT196/110 to KT201/110

This controller provides optimum start, single zone weather compensation and priority DHW (if required). Fit the controller in the boiler. Connection takes place using the supplied rematic adapter plate and the supplied interface that can be integrated in the control panel. Refer to the relevant controller documentation for detailed information.

b) Celcia 20 controller - Part 58222

This controller provides Optimiser/compensator for use on single or multiple boilers (communicates according to the OpenTherm protocol).

c) Modulating cascade controller rematic MC4 - Part KT821 to KT824

The rematic MC4 modular / cascade control unit is supplied with the Celcia 20 controller and is suitable for the modulated control of 2 to 4 Remeha Gas 110 ECO units in modular/cascade in conjunction with the Celcia 20 controller. This controller is wall-mounted and communicates according to the OpenTherm protocol. Several rematic MC controllers can be combined to control more than 4 boilers. Refer to the relevant controller documentation for detailed information.

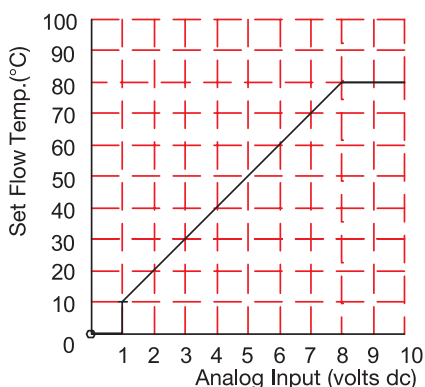
d) Analogue control (0-10v) - Part S55443

Two formats available :

1. Temperature based (10 to 90°C)

Set the minimum and maximum temperatures required on the basis of the voltage supplied by an external analog signal (0-10V DC).

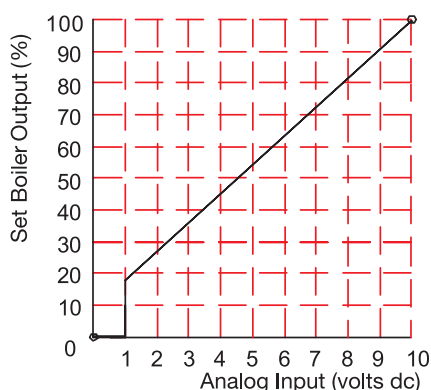
- 0 volt = boiler off
- 0.5 volt = boiler on
- 1 volt = boiler 10°C
- 5 volts = 50°C etc.



2. Output based (18-100%)

Set the minimum and maximum outputs required on the basis of the voltage supplied by an external analog signal (0-10V DC).

- 0 volt = boiler off
- 0.5 volt = boiler on 10%
- 1-10 volt = boiler modulates between 10 and 100% on demand.



e) Optional flue damper - Part S00002685

The flue damper kit is for use on all modular and common flue systems, it should be fitted in the vertical position between the boiler and the header tee. A slip coupling should be accommodated to allow for future access and servicing. Supplied within the kit is a link wire, which links terminals 16 & 23 on the Standard terminal strip - A (page 14). Live is supplied via terminal 24 and neutral via terminal 18, earth bonding is required.

f) Optional outside sensor - Part S62372

The sensor can be fitted to boiler controls to give simple outside weather compensation or in conjunction with the Celcia controller.

3. Frost protection

Install the boiler in a frost-free room. The built-in frost protection system is activated as follows :

Below 7°C the system pump will be switched on if it is connected to the boiler. Pump terminals on boiler terminals 19 & 20.

Below 3°C the boiler will be switched on, but is limited to a flow temperature of 10°C, when both will switch off.

Note: This control function is designed to protect the boiler only, for full frost protection of the system and building, a frost thermostat or weather compensator should be used.

Boiler or system pump

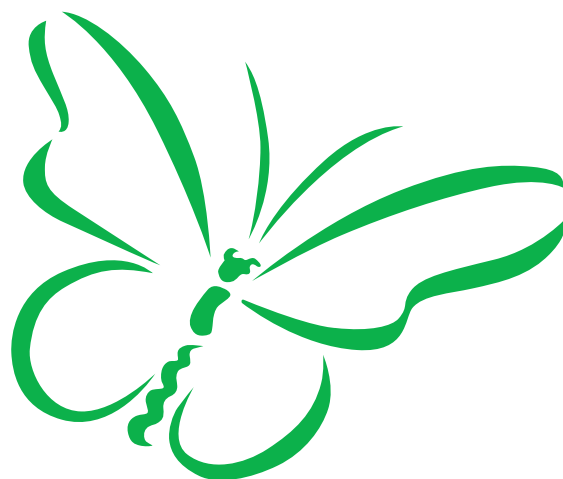
A system pump can be connected to the boiler (230-1-50 supply max. current rating of 1 amp). If the system pump requires more than 1 amp the terminals can only be used to provide a switch signal to a pump relay.

System water quality

Before operation the system should be thoroughly flushed and re-filled with mains cold water. As the heat exchanger is aluminium, if water treatment is considered, a minimum pH level of 7 and a maximum pH level of 9 **MUST NOT BE EXCEEDED**.

The water treatments recommended by Broag are :

- Fernox "Copal"[™] - Sentinal "X-100"[™]
- In addition to strainers we recommend the use of a low loss header to further protect the boiler from system impurities.



TreadLightly

ON THE PLANET

GAS 110 ECO
CONDENSING



Broag Ltd. Head Office

Remeha House
Molly Millars Lane
Wokingham
Berkshire RG41 2QP
T: 0118 978 3434
F: 0118 978 6977
E: boilers@broag-remeha.com

www.uk.remeha.com

The data published in this technical sales leaflet is based on the latest information (at date of publication) and may be subject to revisions. It should be read in conjunction with our full technical brochure (available on request). We reserve the right to continuous development in both design and manufacture, therefore any changes to the technology employed may not be retrospective, nor may we be obliged to adjust earlier supplies accordingly.

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Broag UK is committed to carbon offsetting